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March 2^d 1824

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Ans a very good answer -

Papad March
Inaugural Dissertation 2^d 1824
W. S. H.
on Dean

Yellow Fever

By

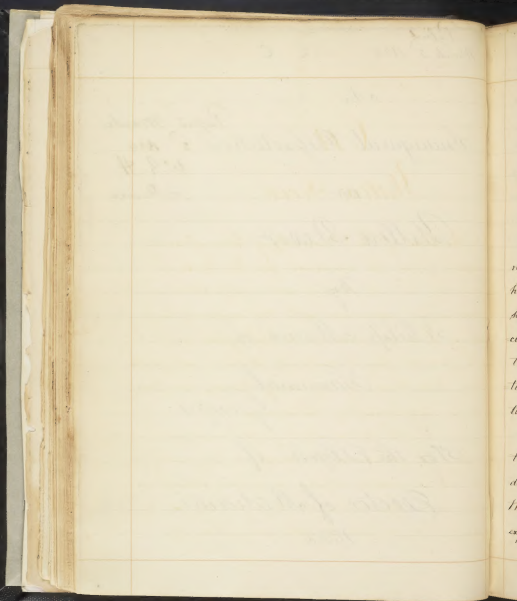
Philip Morris of

Savannah
Georgia

For the Degree of

Doctor of Medicine

1823



ON Yellow Fever

The laws of the University of Pennsylvania, require from the candidate for its Medical honours, that he should write a dissertation on some subject connected with the science of Medicine. It is in obedience to this regulation, that the present essay is composed, without an expectation, that I can, by my early labours, contribute to the improvement of the science.

To select a subject for an inaugural thesis with pretensions to novelty or originality in doctrine or practice, would be a vain attempt in the mere Tyro, whose utmost proficiency can be expected to amount to little more, than an

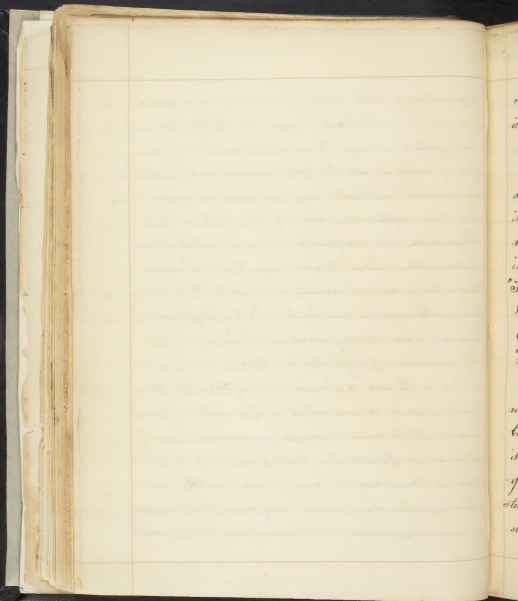
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18th Nov

The time of the month of November
has been the season for the
winter. The weather is cold and
the wind is strong. The snow is
deep and the ice is thick. The
frost is heavy and the sun is
rare. The day is long and the
night is short. The moon is
bright and the stars are
clear. The air is pure and
the water is cold. The land is
frozen and the sea is
icey. The people are
dressed in warm
clothes and the
houses are
well heated.

acquaintance with the rudiments of the science.

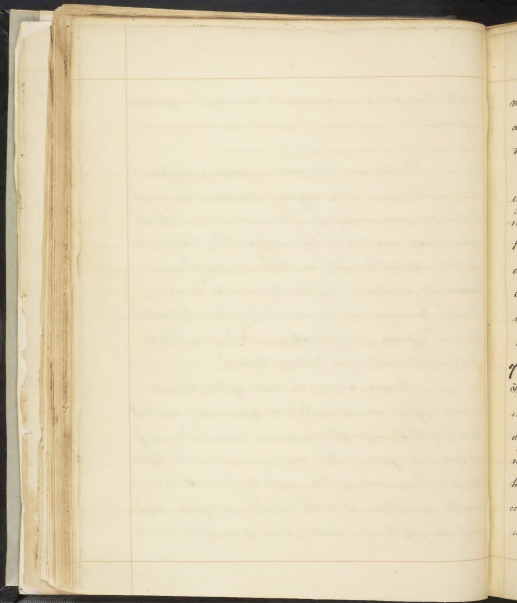
I have chosen the Yellow Fever, that fatal scourge to mankind, as the object of my researches on the present occasion, not with an expectation that I can elucidate a subject that has baffled the skill of the most eminent Physicians, but simply for the reason, that it is a disease with which I am more familiar than any other; having witnessed its destructive ravages, in Savannah during the fall of eighteen hundred and twenty and some cases of it in the summer of eighteen hundred and twenty one whilst a student of Medicine in that city—I am farther led to the selection of this subject from a desire to become thoroughly acquainted with a disease, with which, I may calculate to contend in the course of my future practice in Savannah, my native city, and intended place of residence, whose situation exposes it to be visited



with this fatal disease, in a sporadic or epidemic form.

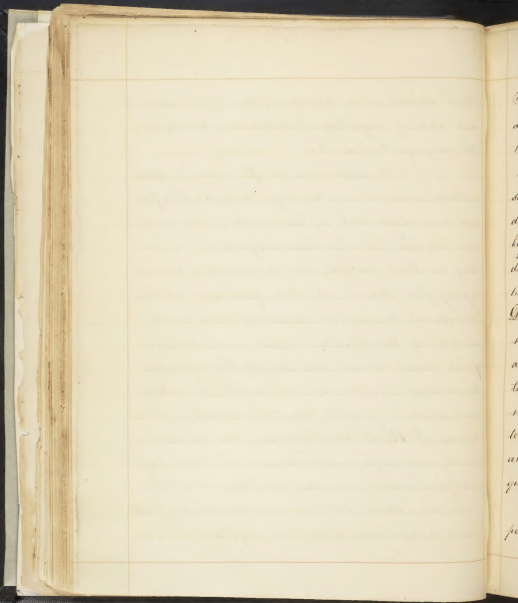
This disease has received many different denominations, in the different countries in which it has occurred, and from the numerous authors who have written on the subject, By the French it has been called "la maladie de Cham" and "Fievre des matelots;" by the Spaniards "Vomito Prieto;" Sauvages has termed it "typhus biliosus;" Cullen "typhus cum flavedine cutis;" and Rush "Bilious Remitting or Yellow Fever."

To give a general view of the disease would require too unlimited a space, and would be altogether superfluous, as we have histories of it from the pens of the most eminent and distinguished Physicians of the eighteenth and nineteenth centuries. I shall therefore, confine myself chiefly to the history and form of the disease



which existed as an epidemic, during the summer and fall of eighteen hundred and twenty in the city of Savannah.

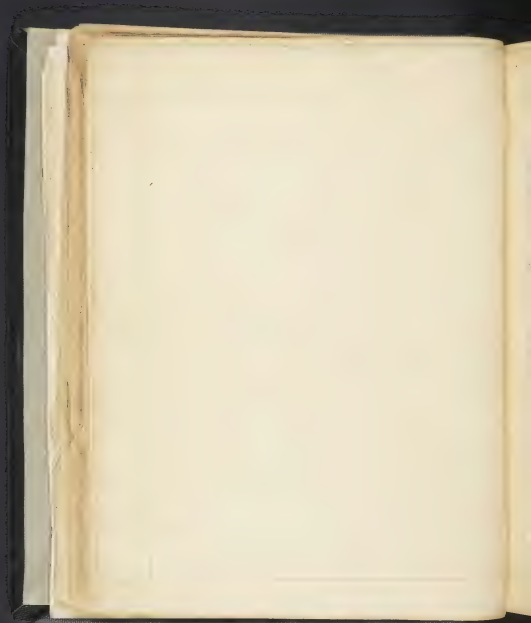
The disease made its appearance in May eighteen hundred and twenty. Previous to this period, even as far back as the month of February, the weather had been unusually warm. On one day in that month, the thermometer rose to eighty five degrees, which is equal to, if it does not exceed the medial mid day heat for the month of August. The medial mid day heat of the whole month was seventy three degrees. The weather became cooler in March, the medial mid day heat of which month was sixty eight degrees. In April the Mercury rose as high as ninety two degrees, and the medial mid day heat was seventy seven degrees. May was a little cooler than April, but the average mid day heat was not less than seventy five degrees.



From this time the heats of summer commenced, and did not abate until September. The whole of the preceding winter was remarkably mild.

The rainy season commenced in the spring months, so that in the three spring months, there was a deposit of nine inches of water. The rainy season began this year three months sooner than it usually does. In June and July, there was as large a quantity of rain fell, as in the three preceding months. During the month of August, thirteen inches of rain fell. In September there was no rain of any consequence, but, from the first of September to the last of December, there fifteen inches of rain water deposited. From the month of March to that of December, at which time the disease was arrested, there was a total deposit of the enormous quantity of forty six inches of water.

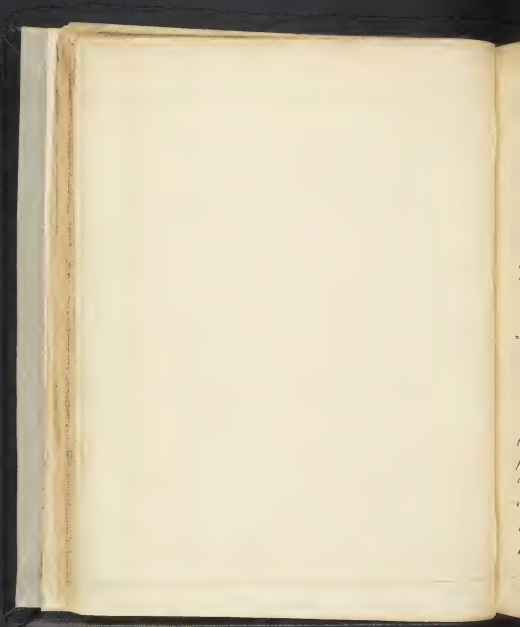
It is remarkable that during the whole of this period, there was a total absence of Thunder and



lightning.

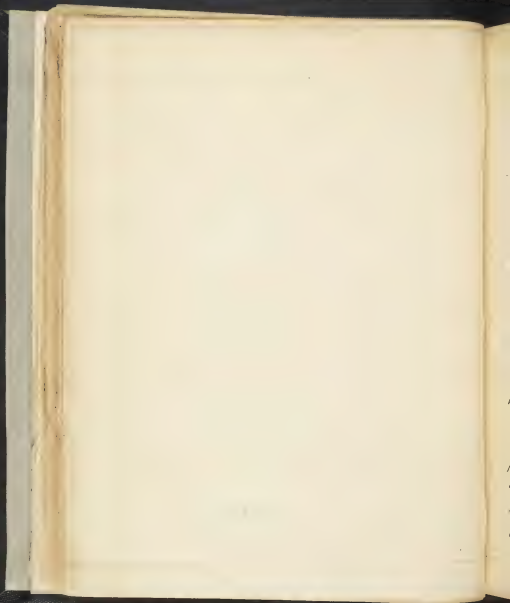
Having premised these Meteorological observations, I submit a slight sketch of the situation of Savannah, as it will be necessary in order to understand the causes of the epidemic, and may also be useful in another part of this dissertation.

The city of Savannah stands on a lofty sand bluff, encompassed on every side excepting a point to the south by extensive marshes and swamps. Not a wind blows from the North, East and West directions, which is not laden with moisture that is deposited in, and retained by the city. The whole extent of country from Savannah to the Atlantic, a distance of fifteen or eighteen miles, consists of rice fields, lands that are below the level of the river, and liable to be inundated by every spring tide, and every time that the river



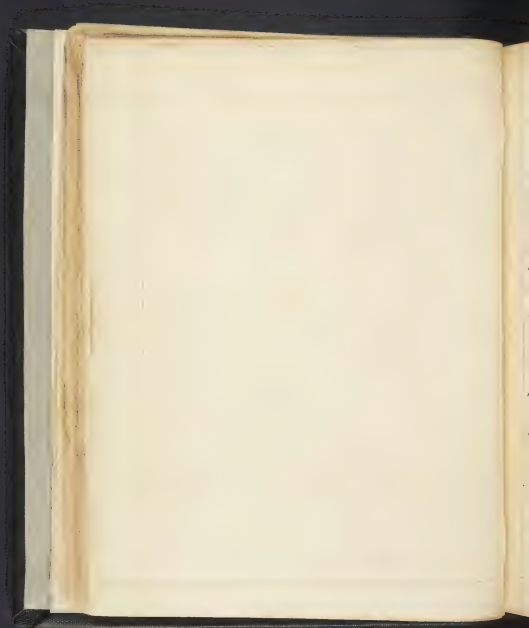
ries which it always does after a large quantity
of rain has fallen, and of uncultivated moras-
ses. During the whole of the summer eighteen
hundred and twenty, the winds were from
the East and North East, and consequently,
must have blown over this unwholesome tract
of country, and as the city is the first elevated
land, it must have been the first to arrest
them in their career. The eldest inhabitants tes-
tify to the insalubriousness of these winds and
by one of the most eminent Physicians in the city
they are called the *Samuel* of Savannah.

In the foregoing statement are to be
found, *Seneceia*, causes fully adequate to account
for the existence of the epidemic. It presents to
us a spring, not to a most unusual degree, ac-
companied with nearly a tropical heat; A sum-
mer past dry with ... *extreme* heat, an
extensive source of Miasmatic poison, which, by
Mr. B. Moring M.D.



the direction of the prevailing winds, must have been wafted into the very bosom of the city— These are circumstances, highly insubitious, as experience in Tropical regions demonstrates, and quite capable to generate fevers of intense malignity.

The disease was generally preceded by some premonitory symptoms, as sick stomach, want of appetite, pain in the head or giddings, or a burning sensation in the stomach. The fever assumed the intermittent, remittent, and continued forms, as was noticed in Philadelphia in seventeen hundred and ninety seven, according to the period of the season. Thus the intermittent form prevailed most frequently in the Spring and Autumn, though some few cases continued to be observed throughout the season. The prevalence of the intermittent type, at those particular seasons,



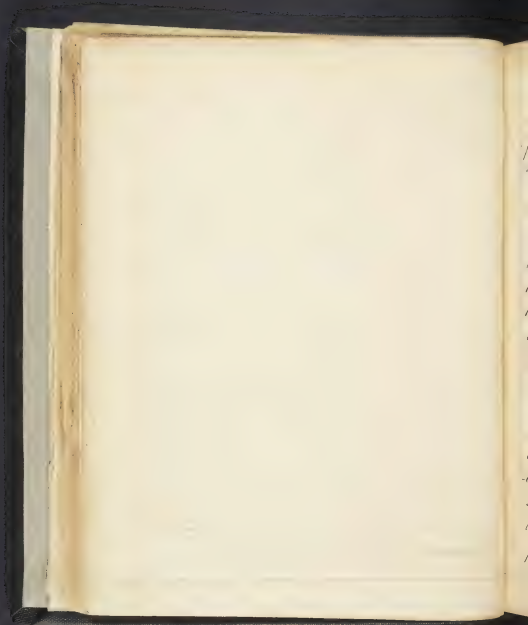
would authorize us to conclude, that the miasmata which produced the fever, was not at those times sufficiently concentrated and abundant to excite the disease in its more violent form. The remittent type also prevailed throughout the epidemic, but was most frequently met with in the middle of the season, when the miasmata were probably more concentrated, yet not sufficiently so to produce a higher grade of the disease. It was not until the last of July that the continued type was completely established, when it proved to be the prevailing type, until the commencement of cold weather. Such was the relation that existed between these forms of the disease to each other.

The intermittent type, sometimes, by neglect or bad treatment, degenerated into a remittent or continued form. It was, however, much the mildest and least fatal type of the disease, though



generally, it was more durable and obstinate, in proportion to its mildness.

The remittent form, commenced in May and was mortal from its commencement. It became more frequent in June, and characterized almost every case in which death occurred during that month. It predominated in July, but in August, began to lose its rank, as a more deadly form of fever predominated. The remittent form of disease was more destructive, than the intermittent, whilst it yielded in numbers to the higher grade of fever which succeeded. The symptoms of the remittent type became aggravated with the advance of the season, and the time of its critical duration was much shortened. This type then approached so near the continued form and becoming attended with black vomit, a very narrow space appeared to separate them. The Physician before alluded to considered cases



of this exalted character, as the last grade of a complete remittent. In many cases, it formed the first stage of a continued type.

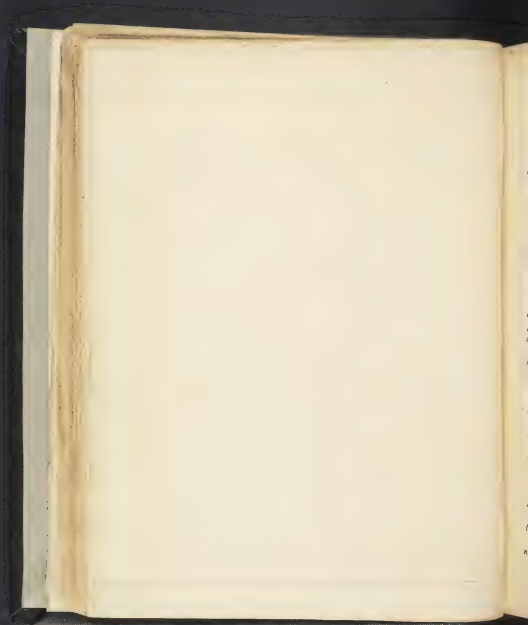
A chill of more or less duration, nine times out of ten, established the disease in the remittent form. For two or three days, the paroxysms were distinct enough then ceased, the continued form commencing, constituting a fever of a mixed type, half remittent-half continued.

The continued type predominated in October. It seemed to depend more upon the malignity of the poison, than a greater liability of constitution. This type was generally established by a chill, followed by a hot fit, which continued without a second paroxysm. The only constant and invariable symptom it presented, was a sense of burning in the



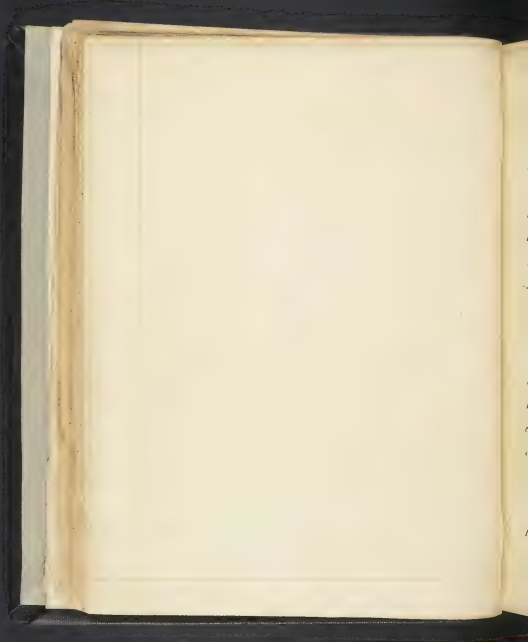
Stomach, and extreme soreness about the epigastric region. This sensation was sometimes so great, that I have heard patients cry out as if in extreme agony, merely from touching the part with my finger. During the latter part of the disease, the patient became tranquil, all exterior signs of disease vanished; the patient felt well, except the burning of the stomach. This symptom indicates the disease to be seated in that organ.

The symptoms about to be mentioned, were all irregular and fluctuating. The eyes were sometimes affected with inflammation, yellowness, sometimes or total loss of vision; the skin was often marked through its entire extent with Ecthima, blotches, purple discolorations or irregular sores; the neck and shoulders were sometimes tinged with a dirty yellow. Sometimes the cheeks and lips, particularly in women, were flushed



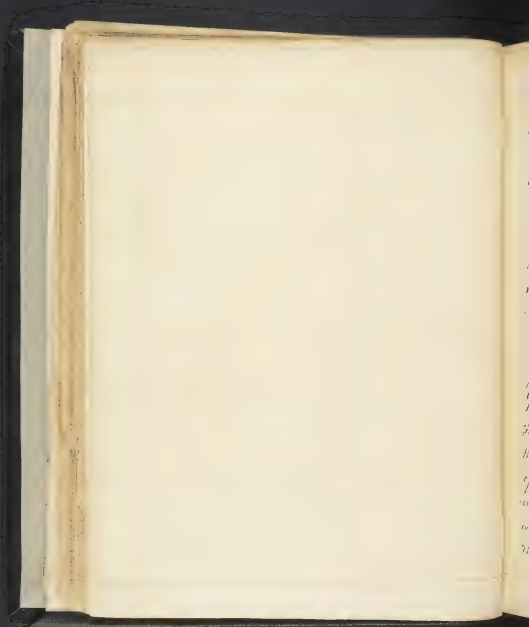
with a beautiful glow; Sometimes, there was deaf-
ness, an unquenchable thirst, the tongue was
covered with a short or long fur or was very
red round its edges, or natural, clear and moist;

Sometimes the muscles were strong, convulsed,
weak, palsied or so painful as to render the
weight of the bedclothes intolerable; Some-
times there was stupor, delirium, fury or loss
of memory in general or for particulars, with
a soundness of all the other faculties, and some-
times a dislike was evinced to every thing, so as
not only to behold death with perfect indiffe-
rence, but with cheerfulness; Sometimes there
were hemorrhages from the nose, gums, ears,
stomach, intestines, uterus and kidneys also from
wounds and blisters. The parotid glands were
sometimes inflamed and suppurated, the respira-
tion laborious and stertorous: the pulse was occasi-
onally rapid and tumultuous, or slow to excess, even

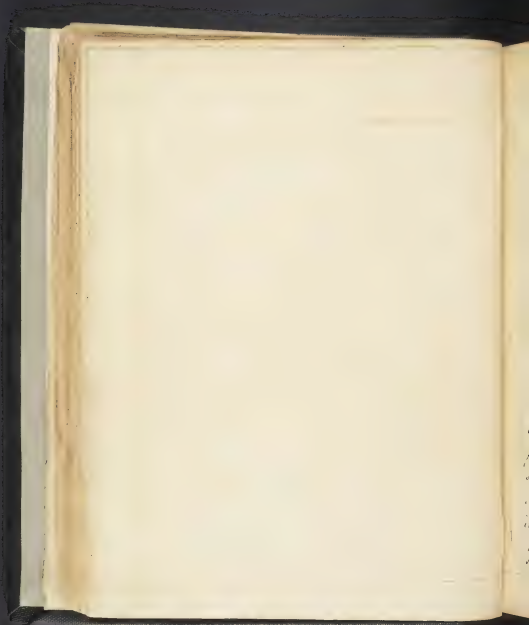


below natural; Sometimes there was pain in the head and loins, and a general soreness over the whole body, pain and palpitation of the heart often existed. The patient was in many instances very much distressed, or was easy and even comfortable throughout the whole attack: hiccup was often troublesome; sometimes there was incessant vomiting, not permitting the patient to rest for a single moment, whilst at others there was little or none at all, or it occurred very seldom: The excretions were scanty or abundant, the faces were either liquid, thick, incoercous, faded, dark or bilious, the urine transparent, turbid or red. A universal sensation of numbness at times prevailed.

The most deadly of all the symptoms was black vomit: after much of it had been ejected from the stomach, the patient felt less of the burning sensation; and on making



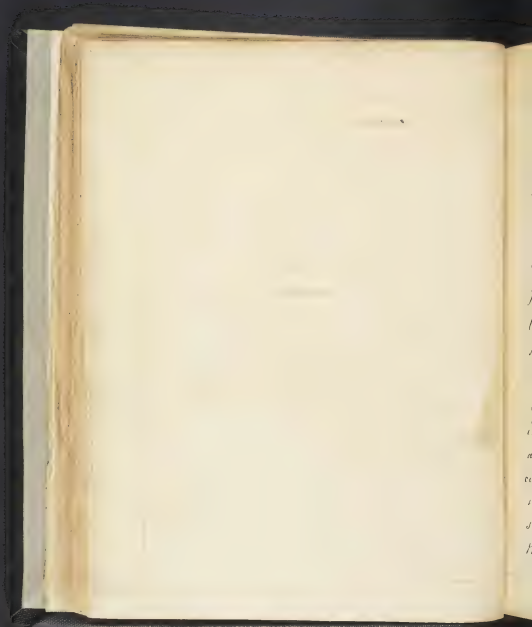
post-mortem examinations in these cases, there was much less inflammation of the stomach found, than in those cases where was of short duration and little or no black matter had been thrown up. My Preceptor examined the bodies of sixty patients, who died with the disease and out of this large number only two bodies were found in which this viscus was not inflamed. He however entertained no doubt, but that inflammation had existed and had been removed by the effusion of black vomit, as both of these subjects had ejected large quantities of it thirty six hours previous to their dissolution. The inflammation was confined altogether to the villous coat of the stomach. I am induced to be of that opinion, from never having succeeded in tracing it any further or discovering the the least indication of it in the other coats of the stomach. The stomach was often found in the highest state



of inflammation and filled with black
vomit, even when there had been little or no
previous vomiting.

It is evident from this train of
formidable symptoms, that the stomach is
the seat of the disease, and they are to be referred
to the lesion of that organ.

Whether the inflammation is the effect or cause
of the disease, I do not feel competent to decide
but, from the little opportunity I have had of
forming an opinion, I think that the fever
is the consequence of the inflammation of the
stomach, and not its cause. In this opinion I
am confirmed by the general views of Dr
Jesse Chapman, respecting fevers. None he con-
siders as truly idiopathic, but, that in every
instance, they are symptomatic of some local
irritation or the lesion of some organ. The
essential idiopathic fevers as they are commonly

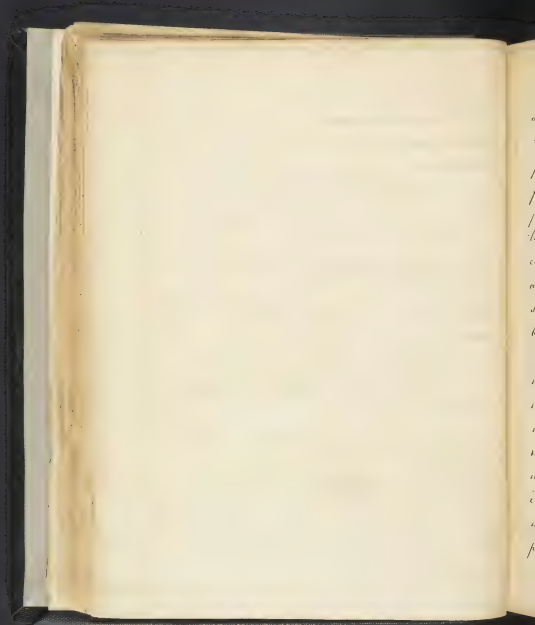


considered, are regarded by him as seated in the stomach and intestines; on which miasmata taken into the stomach primarily act. I am further induced to adopt this view from the analogy between some cases of Gastritis and Typhus Fever.

The different viscera of the body were all found occasionally affected, but, I believe it was not generally the case. Had they been primary affections, they would have occurred more generally and uniformly.

The Remote Causes.

Of Typhus Fever an certain noxious vapours, generated in the process of vegetable, or vegetable and animal decomposition, under peculiar circumstances of moisture and heat; such are marsh miasmata foul air from ill ventilated ships or houses. From what has been said in the preceding part of this dissertation, of the local

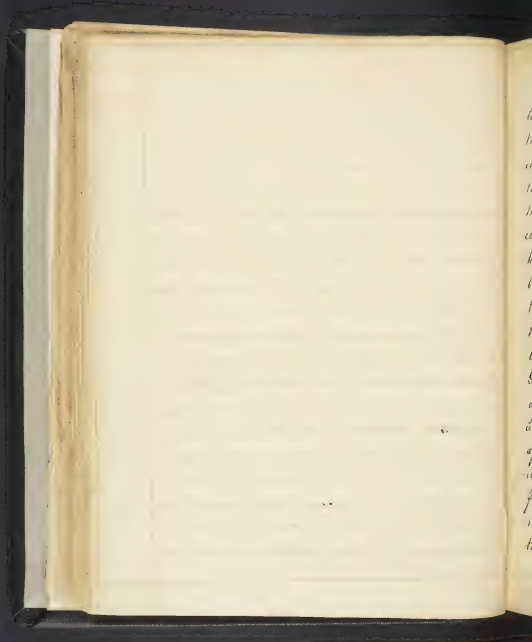


situation of Savannah and of the weather, before the commencement and during the prevalence of the disease, it can not be doubted for a single moment, that the disease was produced by an exhalation from putrid vegetable matter and stagnant water, which is commonly termed miasmata; Can any reasonable man, any man of education, deny for a single moment that a sun almost vertical, beaming on a tract of country similar to that I have described as surrounding Savannah, with the wind and weather cooperating, is not capable of producing an exhalation or miasmata sufficiently poisonous to create a most malignant type of fever. Another cause which I omitted to give, amply sufficient in itself to produce the disease, was the great number of cellars and vaults which were exposed to the operation of the sun and rain by

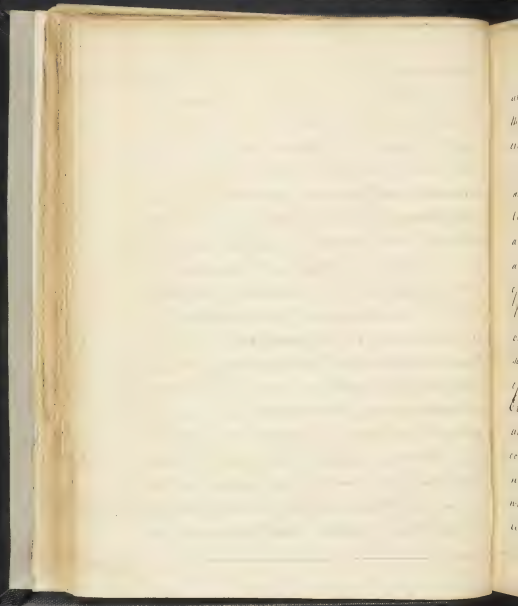
The great fire of January eighteen hundred
and twenty. One of the strongest proofs of the
disease being produced by miasmata is that
it was at first confined to Washington
ward,

and gradually spread over the city; now this ward being at the Eastern extremity of the city, from the direction of the prevailing winds must have been the first to receive the miasmata which was floating in the atmosphere.

It was a doctrine generally entertained by the Medical men of the United States that it was impossible for the disease to be taken except by contagion, or in other words, that it was not a disease of domestic but of foreign origin; This hypothesis has long since been abandoned by the most of them. It is almost needless for me to produce any facts to prove the noncontagiousness of this disease, but as it was supposed by some persons in Savannah

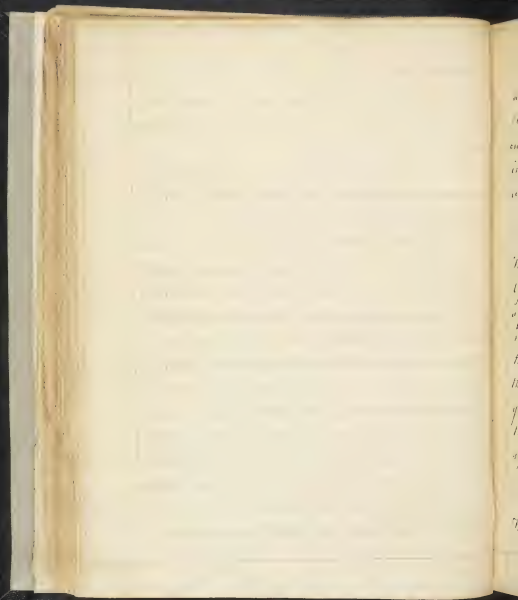


to be imported from the coast of Africa. I think by adducing facts to prove the non importation of the disease, with the facts that have been stated above, would be in themselves sufficient to establish the non contagiousness of the Yellow fever. There are however more powerful facts that will be mentioned hereafter. It was said by those in favour of importation of the disease, that it was brought from the coast of Africa in a Patriot privateer called the General Ramirez. Unfortunately for this assertion, this vessel not only arrived with a healthy crew but she arrived some days after the disease had prevailed with severity. Fourteen deaths took place in June from the fever and a gentleman by the name of Stanton died of black vomit on the sixteenth of July. The Ramirez did not



arrive until the twenty second, so it is clearly proven
that it was not and could not have been of African
origin.

Those who advocate the doctrine of contagion,
advance in its support that the yellow fever has
been repeatedly communicated in the country
and that the system is not liable to a second
attack - My own experience is opposed to both
of these positions. It has come to my knowledge
that many individuals who returned to the
country, were attacked with the disease and
some died there, but not a solitary instance
of communication of the disease was observed.
Every circumstance combined to favour the
action of a contagious poison did it exist: the
country houses were crowded by the population
who had fled the city, and the accommodations
were frequently extremely inclement and incon-
venient. Individuals who have experienced a



second attack of Yellow fever are to be met with.
Some have fallen under my own notice, a relation
of mine has twice been affected with the disease
in New Orleans, and a friend, a gentleman of this
city has shared the same fate in the West-Indies.

The Exciting Causes.

These are various, when the system is predisposed
by the action of miasmata. I shall enumerate
a few of the most active. Grief, Fear, Intempe-
rance either in eating or drinking, Exposure to
the sun or night-air, are the most usual. When
these causes indirect debility is produced, which
gives the predisposing cause a chance to act, and
thus destroys the healthy equilibrium of the
system, then the disease is excited.

The Treatment

From the account that has been given of the

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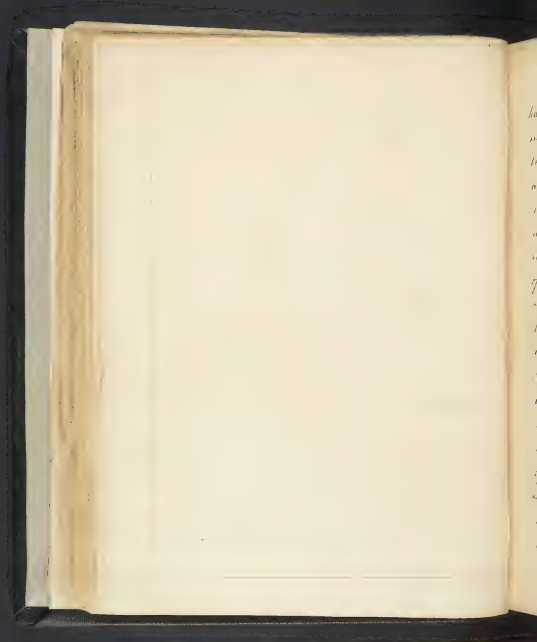
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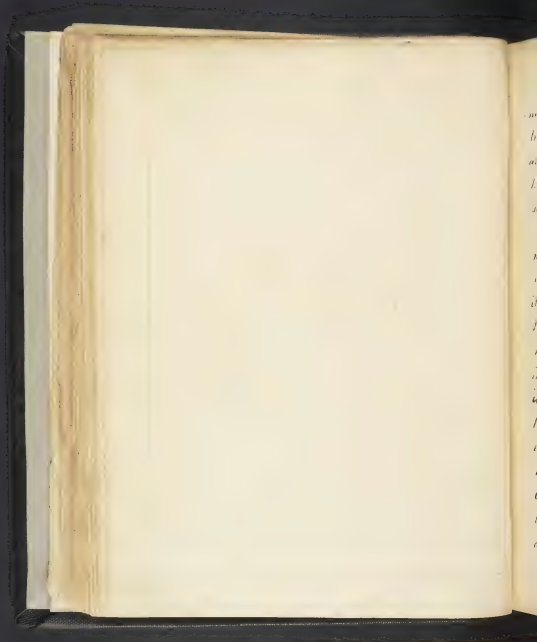
disease it would appear to be ascertained as partaking of an inflammatory character. The treatment necessary to be used for the cure, when considered in this light, must be obvious to every enlightened practitioner, and experience, in addition to the dictates of reason, proved the superiority of the depleting and sedative practice to that of the stimulating.

Stimulating substances always prove injurious or aggravating except in extreme cases of individual occurrence, I would as soon attempt to cure Pneumonia by wine, brandy, laudanum and turpentine as to cure Yellow fever by them.

To me it appears the proper practice to diminish the general morbid excitement, which pervades the system, in this disease, at the same time that the local affections are met by an appropriate treatment. Stimulating medicines according to their acknowledged ^{action} on our systems must



have the tendency to increase this morbid excitement, and therefore, prove detrimental in the treatment; Such was proved to be the fact on the administering of wine, bark, laudum, camphor, mesch, pepper, sugar of lead, snake root, turpentine and articles of this nature, they often increased the calamities of the patient. The reported success of the oil of turpentine in Philadelphia, and sugar of lead in Charleston, induced my preceptor to give them a fair trial, but he found them to be injurious or doubtful remedies. He employed the sugar of lead both before and after blood-letting without the least success. The turpentine was used in forty one cases, and out of this large number, only eight recovered its use. The remedy often produced a dysenteric state of the bowels attended with tenesmus, and in these cases it must have unquestionably done harm. On dissection of these persons who took the turpentine, the inflam-



mation appeared more extensive, than those who were treated in a different manner. The turpentine was administered in doses of thirty drops every half hour, in some syrup; Sometimes the dose was increased to sixty drops every half hour.

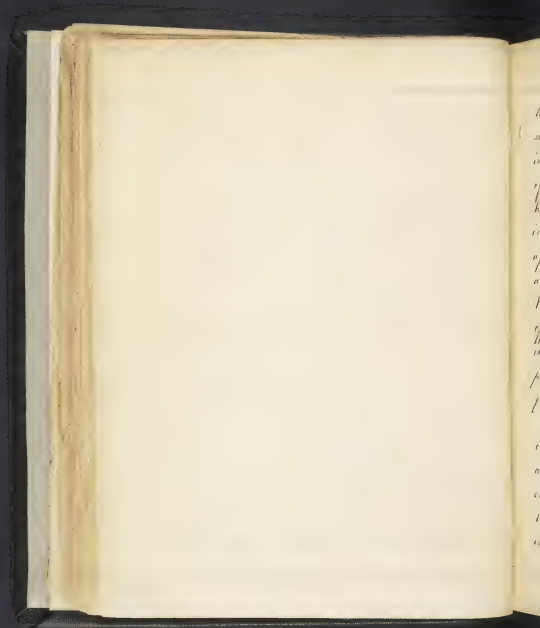
The remedies in the mild state of the fever, when the stomach was only in a state of irritation were such as to allay the irritation and prevent it from running into actual inflammation. In the more severe cases as in the continued form, when the stomach passes into a state of high inflammation, it calls for remedies suited to its condition. The treatment which was used in the intermittent and remittent forms of the disease, was of a bold and powerful nature, suited to the violence of the affection. It consisted of bloodletting in a greater or less degree according to the circumstances of the case; of strong evacuates, as emetics, cathartics, blisters and of mercury

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as a salivant. The last was found useful in very severe cases; When a salivation was once effected, the patient recovered or improved from that time. The propitious moment for the administration of Mercury was during the mild stage. The effect for which the mercury is given, is accelerated, when depleting and antiphlogistic remedies have been premised.

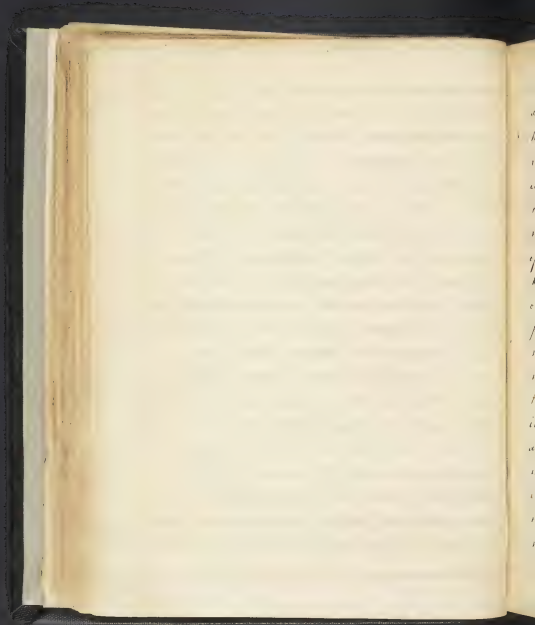
The treatment used in the continued form, at the commencement of the season was venesection, active cathartics blisters and mercury as a salivant: in the latter part of the season, small doses of castor oil, demulcents, acid drinks and sometimes mercury as a salivant.

The lancet succeeded early in the season at the hospital, which is but a short distance from the city, while in the town it was attended with no success at all. Dr Cotton (the hospital Physician, was obliged to lay aside his



lancet, which he used very freely, as the season advanced, and resorted to mercury as a salivant, and succeeded in many instances, His plan of treatment was to give calomel every two hours in doses of five grains, without promising it by any other remedies. This treatment afterwards failed in consequence of the quick accession of inflammation in the stomach. When this occurred the medicine either ran off by the bowels or promoted black vomiting in this stage of the disease it is a very improper remedy; The plan of cure that was found the most successful was the following.

The bowels were kept gently open with castor oil, which was found to be less irritating than any other evacuant; The food and drink were constituted of arrow root acidulated with lime juice, the patient was sometimes allowed to take twelve ounces of lime water and the



same quantity of sweet milk in the twenty four hours, without any other food or drink: the vomiting was often suppressed by this remedy, even after the secretion of black vomit. Blisters were found useful to keep up external excitement, and, as auxillaries applied to the inside of the arms and over the epigastric region, and kept perpetual by dressing them with tartarion or any other stimulating ointment. Those patients who recovered after having black vomit were treated in the above manner. Injections were also administered for the purpose of keeping the bowels evacuated. At an early period before inflammation was completely established, and the pulse was active and tense, venesection was found to be a proper remedy, but, from experience, it is to be considered as a dangerous one. Emetics in the few cases in which they were employed, proved useful when administered

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before the accession of inflammation, after that period, the knowledge that we have of the nature and seat of the disease, would teach us that they must be injurious. Drastic cathartics were found hurtful as they not only increased the disease, but produced premature debility. Sudorifics, when stimulant were, and when compound of nauseating doses of *Spicecuantha* or *Urtica*, they harassed the stomach without being productive of any benefit. Cold water applied with sponges to the body or by affusion was found a useful auxiliary.

The mild practice is that which was found the most efficient in the extreme grades of this epidemic. When the diversity of the symptoms and the malignity of the disease, every plan of treatment that had ever been suggested or could be devised by the

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Physicians of Savannah nas tried, but none proved so successful as the mild practice just described.

For this imperfect sketch of the epidemic which raged in the city of Savannah in the summer and fall of eighteen hundred and twenty, which deprived our city of some of its most valuable citizens and society of some of its brightest ornaments, I am more indebted to the observations and experience of my preceptor Wmth Waring M.D. who witnessed its progress, than my own, as it was not until the disease was on its decline that I commenced the study of Medicine.

The performance of a Medical Essay like myself, I am conscious must contain necessarily many imperfections, especially in the first essay of his pen, for which I must solicit your candid indulgence. Should it prove sufficient to

convince, that the information constantly presented to the attentive student in the valuable course of instruction delivered from the chairs of this school, has not been neglected, will I presume, be adequate to satisfy the liberal and enlightened board to whom it is submitted and who are to determine on its merits. In this persuasion I consign my essay to its fate without an apprehension that it will have any thing to fear from fastidious criticism or censorious severity.

consequence that the information necessarily arising
led to the attention directed to the contents
of the subject, and not to the subject itself.
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